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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/031,087 02/26/98 CHIANG

C CL85012

EXAMINER

HM12/1209

QUEST DIAGNOSTICS INCORPORATED  
33608 ORTEGA HIGHWAY  
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TUNG, J

ART UNIT

PAPER NUMBER

1653

10

DATE MAILED:

12/09/99

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
**09/031,087**

Applicant(s)  
**Chiang et al.**

Examiner  
**Joyce Tung**

Group Art Unit  
**1653**



☒ Responsive to communication(s) filed on Sep 20, 1999

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-19 is/are pending in the application.

Of the above, claim(s) 12 is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-11 and 13-19 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☒ Claims 1-12 are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 7

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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***Response to Amendment***

The Group and/or Art Unit location of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group Art Unit 1653.

1. Applicants' arguments, filed 9/20/99, have been fully considered but they are not deemed to be persuasive. Rejections and /or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.
2. Regarding the amendment to the specification in the response, at pg. 2, line 2, the word "by", pg. 7, lines 16-17 the word "ration", pg. 7, line 18, the word "ration" and pg. 8, line 14, the word "Runer" can not be found. At pg. 6, lines 23 and 25, there are many "gene"s. It is unclear which "gene" needs to be replaced.

Additionally, it is unclear which first row of Table 1 needs to be deleted. In Table I-III, where is the insertions of SEQ ID NOs taken place.

It is suggested to clarify confusion.

3. Regarding the rejection of claims 1-11 under 102(e), the response argues that Di Cesare does not teach or suggest the claimed invention in which the "analytical probe is blocked at its 3' end and cannot be extended and is then hydrolyzed by use of a nucleic acid polymerase having 5' to 3' exonuclease activity. However, in the specification, the polymerase used is a Taq

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polymerase or an equivalent thermostable DNA polymerase (See pg. 3, lines 6-8). The Taq polymerase or the equivalent thermostable DNA polymerase used in the specification does not necessarily mean that the polymerase has 5'-3' exonuclease activity or not. It really depends on which one is used. The oligonucleotide probe is blocked at 3' end (See pg. 4, lines 14-17). Thus, the rejection is maintained.

4. Claims 1-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Di Cesare (5,716,784).

***Claim Rejections - 35 USC § 112***

5. Claims <sup>1-11 and 13-19</sup>~~1-19~~ are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The polymerase used in the instant invention as indicated in the Specification does not necessarily mean that the polymerase is without 5' to 3' exonuclease activity (See pg. 3, lines 6-8). The ratio of the second probe to the first probe is not supported in the specification. Thus, it is new matter.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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7. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 is vague and indefinite because the abbreviation "HCV". It is suggested to use a complete name for the term.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1 and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Di Cesare (5,716,784) in view of Hiroaki et al. (EP 0 461 863 A1).

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Claim 1 was rejected under 102(e) in section 11 of the Office action mailed 3/15/99.

Di Cesare discloses an improved assay to detect or measure target nucleic acid sequence replication in a thermal PCR amplification procedure. The assay uses an analytical probe labeled with an energy transfer donor fluorophore at 5' terminal, a detection probe labeled with an energy transfer acceptor fluorophore at 3' terminal and the result is determined by energy transfer measurement (see column 2, lines 24-58) which provides a measure of amount of target nucleic acid amplified in PCR (see column 2, lines 57-58). This is also a measure of degree of amplification of the target (see column 6, lines 50-51). The analytical probe hybridized to the target nucleic acid is longer than the detection probe by 16 nucleotides at 3' terminal which hybridizes to the analytical probe (see column 6, lines 8-16). Fluorescence energy transfer between a donor and acceptor molecule can be highly efficient within close proximity about 50 Å (See column 4, lines 50-57).

Di Cesare does not disclose using SEQ ID NO: 1-4 to detect HCV.

Hiroaki et al. disclose a highly sensitive detection system for NANB hepatitis virus at its gene level and oligonucleotide primer used for the system (See pg. 2, lines 31-32). The NANB hepatitis is termed hepatitis C virus (HCV) (See pg. 2, lines 10-12). A nucleotide sequence of the 5' noncoding region from HC-J1 has identified (See pg. 3, lines 4-32). The primers used in the highly sensitive detection system for HCV corresponding to the part of the 5' noncoding region of HCV are disclosed (See pg. 3, lines 38-42). The nucleotide of the 5' noncoding region

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comprises SEQ ID NO: 1 and 3 and the complementary sequence of SEQ ID NO 2 and base pair 1-17 of SEQ ID NO: 4 (See pg. 7, lines 11-21 and pg. 8, lines 15-19).

The teachings of Di Cesare and Hiroaki et al. suggest the limitations of instant claims 1 and 14-18. The summary of instant claim 1 was set forth in section 11 of the Office action mailed 3/15/99. Instant claims 14-18 recite further limitations to instant claim 1 in which the method applies probes (SEQ ID NO: 3-4) and primers (SEQ ID NO: 1-2) to detect HCV genome.

One having ordinary skill in the art would have motivate to combine the references of Di Cesare and Hiroaki et al. because the method of Di Cesare has high levels of sensitivity. specificity and reproducibility (See column 8, lines 24-27) without requiring a multitude of handling or separation steps (See column 2, lines 11-21) and as indicated by Hiroaki et al. above the primers used in the highly sensitive detection system for detecting HCV correspond to the part of the 5' noncoding region of HCV (See pg. 3, lines 38-42). The nucleotide of the 5' noncoding region comprises SEQ ID NO: 1 and 3 and the complementary sequence of SEQ ID NO 2 and base pair 1-17 of SEQ ID NO: 4 (See pg. 7, lines 11-21 and pg. 8, lines 15-19). It would have been prima facie obvious for an artisan of ordinary skill in the art at the time of the instant invention to choose any probes and primers from the 5' noncoding region of HCV to carry out the method and make the probes and primers as claimed.

10. Claims 1 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Di Cesare (5,716,784) in view of Walker et al. (5,270,184).

Claim 1 was rejected under 102(e) in section 11 of the Office action mailed 3/15/99.

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The teachings of Di Cesare are set forth in section 9 above.

Di Cesare does not disclose strand displacement amplification method

Walker et al. disclose strand displacement amplification method for generating target nucleic acid sequence (See the Abstract).

The teachings of Di Cesare and Walker et al. suggest instant claims 1 and 19. The summary of instant claim 1 was set forth in section 11 of the Office action mailed 3/15/99. Instant claim 19 recites further limitation to claim 1 in which the amplification method can be strand displacement amplification.

One having ordinary skill in the art would have motivate to apply the method of Walker et al. to amplify the target nucleic acid sequence as taught by Walker et al. because the method of Di Cesare has high levels of sensitivity. specificity and reproducibility (See column 8, lines 24-27) and the method of Walker et al. is used for generating target nucleic acid sequence and applicable for both DNA and RNA (See the Abstract) and the amplified products can be used for detection (See column 5, lines 7-8). It would have been prima facie obvious to carry out the method as claimed.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO



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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

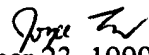
12. Any inquiries concerning this communication or earlier communications from the examiner should be directed to Joyce Tung whose telephone number is (703) 305-7112. The examiner can normally be reached on Monday-Friday from 8:00 AM-4:30 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached at (703) 308-1152.

Any inquiries of a general nature or relating to the status of this application should be directed to the Chemical/Matrix receptionist whose telephone number is (703) 308-0196.

13. Papers related to this application may be submitted to Group 1600 by facsimile transmission. Papers should be faxed to Art Unit 1653 via the PTO Fax Center located in Crystal Mall 1 using (703) 305-3014 or 308-4242. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989).

Joyce Tung

  
November 23, 1999

  
ARDIN H. MARSCHEL  
PRIMARY EXAMINER